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Priming the Product Pipeline

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Medrad, Inc. has enjoyed a long history of firsts. Since 1964, when its physician founder created the first ultrasound injection system, Medrad has introduced a steady stream of successful medical imaging products, leading to consistent 15%-20% annual growth over the last decade.

With its fundamental markets maturing, however, Medrad recently decided to take measures to cement its place as a leading provider of ancillary medical imaging products. Specifically, the medical device manufacturer wanted to ensure that its innovation success rate could hold up against global competition.

"Innovation is a critical success factor in our industry -- I don't think you could find a single medical device manufacturer who hasn't had a continual stream of innovation," notes Don DeLauder, executive director of product innovation and advanced development for Medrad (Indianola, PA).

As part of a reorganization two and a half years ago, Medrad formed a dedicated innovation group and put software tools in place to add rigor to what had been ad hoc innovation practices. The new tools and processes have helped Medrad focus on those new product programs that have the greatest potential impact and also increase its rate of new product innovation.

"Historically, we've gone the classic route with invention -- thinking of things and working on them and hoping something would come out of it," DeLauder says. "We wanted to bring more process to innovation and not let things happen haphazardly. We felt like we weren't getting as much out of our innovation organization as we could."

Medrad may be on its way to addressing a key challenge of today's manufacturing environment, but a lot of other companies are only just starting to get the message about transforming for sustained innovation. After more than a decade spent putting systems and processes in place to streamline and improve operations, manufacturers are now facing a competitive climate that emphasizes organic growth through new product revenue.

But just generating more ideas and feeding more new products into the pipeline isn't necessarily the answer to meeting this challenge of more innovation. Recent studies by Deloitte Research indicate that 86% of new product ideas never come to fruition, and, of those that do, 50%-70%

fail for a number of reasons, the most prominent being a missed market opportunity or a deliverable that no longer aligns with customer requirements.

The test for today's manufacturers, then, is to direct limited resources and tight R&D budgets to the mix of products that will best resonate with customers and deliver the optimal value to the company. In order to get better at this, many manufacturers are adopting new, formal processes that help them evaluate the potential of new product ideas. And some are turning to software that helps support those processes.

"Faster-to-market isn't necessarily the thing that improves the bottom line," explains Bill Boswell, senior director of Teamcenter marketing for UGS (Plano, TX), a provider of product lifecycle management (PLM) software. "Being right to market with the right product that addresses customer need -- that's what companies need to do better."

No Black Art

Part of the problem is the misperception among many manufacturers that innovation is a black art that is hard to replicate, control, or plan. Manufacturers also have a hard time determining and understanding the risks and market uncertainties that will have an impact on whether new ideas (i.e., potential products) will be successful or not. And many times, decisions surrounding resource allocation get clouded by corporate politics.

"Companies aren't really facing the fact that there is risk and uncertainty surrounding [new product introductions] and that they should quantify that risk," contends Don Creswell, co-founder of SmartOrg Inc. (Menlo Park, CA), which offers products and services to help companies make value-based decisions about where and how much to invest in R&D.

"Companies can get into trouble when project champions fight for their projects -- you can construct a spreadsheet to prove anything you want to prove and get the money."

What's needed, Creswell and other experts contend, are more rigorous processes and procedures, including those by which ideas are subject to an ongoing set of agreed-upon business metrics that will ultimately prove or dispel their value. Some manufacturers have started down that path with the Stage-Gate process, a conceptual and operational roadmap for moving a new product project from idea to launch that was developed by Robert Cooper, Ph.D., and Scott Edgett, Ph.D., of the Product Development Institute Inc. (Ancaster, ON).

Portfolio management software programs, from companies such as Centric Software Inc., Sopheon, and Integrated Development Enterprise (IDe), aim to automate the Stage-Gate process and take it a step further by adding analytical capabilities for evaluating potential products as an entire portfolio rather than individual investments. PLM vendors like UGS, Agile Software Corp., Dassault Systemes, and others are also expanding their product suites with portfolio management, program management, and customer-requirements management functions to help automate and put structure to more of these front-end, new product introduction processes.

"We're starting to see increased demand in this category because of the focus on innovation," says Jim Brown, vice president of product innovation and engineering research for

AberdeenGroup (Stamford, CT). "But it's slow-going because it's yet another software platform, it's expensive and heavy on the consulting side, and it requires organizational and process change."

Going Out on a Limb

For category leaders like Medrad, however, there is no avoiding the organizational and process changes needed to improve innovation. Even with a dedicated group in place to focus on new product ideas, Medrad soon realized it would have to break from traditional innovation practices if it was to get the high levels of innovation productivity it needed.

"We needed to be fiscally responsible and be able to measure the output of the group so we knew whether it was going in a positive or negative direction," DeLauder says.

The problem wasn't soliciting the ideas; the group of only 32 people had 25 to 30 projects in the works at any given time. Instead, Medrad needed to narrow down its portfolio of projects to those that would deliver the most value. At first, Medrad built its own Web-based tool for capturing ideas and allowing the team to vote on whether they had merit. However, that system was limited, DeLauder says, because it wasn't searchable and oftentimes ideas that went in became quickly inaccessible to the team.

Medrad eventually replaced its homegrown system with Centric Software Inc.'s OpenPLM portfolio and project management tool. The software helps the medical device maker manage and track its product ideas, and it also lets Medrad create project "sandboxes," where a templated set of 15 to 20 business metrics -- money spent, key milestones, and estimated market size, for example -- are applied to each project for comparison so Medrad can confidently choose the ones of most value. Since putting the new processes and tools in place, Medrad has reduced its project portfolio to around 12 key initiatives. The company has also boosted its patent portfolio as a result of the group's activities -- from around 10 patents per year to about 20, DeLauder says.

"This was in part due to the added efficiencies and focus we've achieved through rigor and processes afforded by a relatively simple tool," he adds.

Parker Hannifin Corp. (Cleveland), an \$8 billion-plus manufacturer of motion and control products, also embraced portfolio management and the Stage-Gate process as a way to strategically identify potential new products and, ultimately, boost its revenue through organic growth. The company, which, through acquisition, had morphed into eight business groups encompassing 100-plus divisions, is now aiming for a more profitable means of growth through the launch of new, innovative products, according to Craig Maxwell, vice president of technology & innovation.

"We needed products that would differentiate [us] at a higher level than ever before," Maxwell says. "By combining all the Parker Hannifin knowledge across all our different domains, we could start creating products that didn't exist anywhere else in the world."

Setting the Stage

To do that, Maxwell needed to open up all of the company's domain knowledge, which in 2003 was locked up in the individual information silos of each of the company's divisions. Parker Hannifin was connected from an operational standpoint -- all the divisions were on a common financial system -- but when it came to sharing new product ideas, requirements, and other materials related to innovation, the company was much more immature.

"People believe that innovation is this mysterious thing that goes on behind closed doors, in the middle of the night," he says. "We wanted to reduce the art of innovation into a process that could be institutionalized and replicated over and over again."

Over the last few years, Maxwell brought in Sopheon's Accolade product development system to serve as a global home base for all new product project-related information. The software helps the innovation team evaluate the potential value of projects in the pipeline, lets teams align resources where they need to be, and promotes reuse of designs and ideas across divisions.

The software -- and the resulting new business processes -- has completely changed how the various Parker Hannifin groups approach innovation. "We tended to shotgun things and go after the projects that a customer might ask for and, nine out of 10 times, we went down a dead end," Maxwell admits. "There was no process for doing in-depth analysis to understand whether or not this really was a valuable project that would deliver a good return on investment."

Today, Maxwell says, Parker Hannifin groups are much better at pinpointing projects with a high potential for return. Once the Sopheon software was implemented, about half the projects in play disappeared overnight, he says. And there's been a significant financial payoff as well: For the last two years, Parker Hannifin has achieved 8% organic annual growth, Maxwell says.

Hewlett-Packard Co.'s Imaging and Printing Group also credits an innovation makeover for its recent success in expanding into new markets such as rear-projection TVs and retail photo solutions. With its traditional consumer printer and consumables markets on a slow decline, the HP group wanted to identify new opportunities for leveraging its IP, says Ralph Morales, III, finance leader in HP's Retail Photofinishing Solutions group (San Diego). Morales, who in 2001 helped start an innovation incubator within the group, says HP had the engineering talent and organizational structure but lacked a framework for evaluating its product ideas. Working with SmartOrg consultants, the HP group came up with new business processes and a modeling approach for evaluating the potential of ideas.

In the five years since they have been at it, the HP group has culled thousands of one-page ideas that ultimately launched four new successful business lines.

"Three years ago, we couldn't have accomplished this without rigor and processes in place," Morales says. "We've learned to focus resources on the things that are important and to find out early [in the process] what will make or break a business."